SPRING 2002
PHYSICS 315 – COMBAT AVIATION PHYSICS
ADMINISTRATIVE NOTES

COURSE DESCRIPTION

The main goal of this course is for you to learn and appreciate the physics of modern aerial combat. To accomplish this, the course is broken into three blocks – *Combat Maneuvering, Offensive Electronic Warfare and Defensive Electronic Warfare*. In your first block, Combat Maneuvering, you will learn the physics principles driving the tactics and maneuvers used in aerial combat. In the next block, Offensive Electronic Warfare, you will learn the principles needed for dominant use of the electromagnetic spectrum, primarily using fighter aircraft radars as the instructional vehicle. In the final block, Defensive Electronic Warfare, you will learn about advanced radar techniques as well as a few of the many passive sensors that will allow you to survive the enemy's presence on the electronic battlefield.

YOUR INSTRUCTOR

LtCol Ed Tomme
Office Phone: 3-2179
Office: 2A111

Home Number: [redacted]
E-mail: ed.tomme@usafa.af.mil
Teach: M2, M3, M6, T-6, Fly: T-day mornings

TEXTBOOKS

We will study from three texts chosen to highlight different aspects of combat aviation. The course textbooks are **Fighter Combat: Tactics and Maneuvering** by Shaw, **Introduction to Airborne Radar** by Stimson, and **Multi-Command Handbook 11-F16 Volume 5, F-16 Combat Aircraft Fundamentals**. You are required to personally possess a copy of both of the first two books and possess an electronic copy of the latter handbook for the duration of Physics 315. You can download the Adobe Reader (what you will need to open the pub) and the publication MCH 11-F16 Volume 5 from my web page (file:///K|/Campus/DF/DFP/Tomme/index.htm). Choose the "Physics 315 Main Page" Link, then choose the "Get the Adobe Acrobat Reader" link. Next, choose, the "Download 11-F16v5" link to copy the pub to your own hard drive. You'll probably find all three of these publications are books you won't want to sell back!

COURSE GRADING

The point breakdown for the course is as follows:

2 Graded Reviews (700 points each)	1400	33.3%
1 Final Examination	1400	33.3%
6 Application Exercises (100 points each)	600	14.3%
5 Problem Sets (100 points each)	500	12.0%
Instructor Prerogative (IP)	300	7.1%
TOTAL	4200	100.0%

Note that 1250 points (30% of the total) will be assigned before prog, including 150 IP points.

LATE OR MISSED WORK

All homework, problem sets, and application exercises are due at the beginning of class. If you choose not to turn in an assignment on the day it is due, your score for that assignment will be zero until you turn it in. If you know you will miss a class on the day an assignment is due, make *prior* arrangements with your instructor regarding the assignment. Work turned in late without prior coordination with your instructor will lose 25% of the possible points per calendar day. **Example**: If you turn in an assignment one day late and score a 60 out of a 100, then you will receive a 45 (60x75%).

INSTRUCTOR PREROGATIVE (IP) POINTS

IP points will come from quizzes, extra homework assignments, GR corrections, in-class competitions, any learning activity that improves your knowledge of combat aviation physics, and instructor subjectivity. The actual points given for various activities will be scaled to 150 IP points at prog (lesson T20) and to an additional 150 points at the end of the semester.

COLLABORATION AND DOCUMENTATION GUIDELINES

When solving homework or other, out-of-class assigned problems, We encourage you to work with others to develop your problem-solving skills. As with any skill, the only way to develop it is through continued practice.

For all Physics 315 graded homework, problem sets, and application exercises you may use the following AUTHORIZED RESOURCES: *any published or unpublished sources and any individuals*.

However, you must document all sources of help, people or material, using the Physics Department's documentation standards (see the next page). Any work that is merely copied from some source will receive minimal credit. If you have questions concerning documentation, ask your instructor.

The intent of joint effort assignments is to help you learn the course material and to deepen your understanding of that material. However, please don't use "joint effort" as a crutch, simply counting on classmates to give you the answers. It's fine to compare answers to help locate and correct a trivial error or two. It's also acceptable to get help understanding how to do a problem with which you had trouble. But, it is not appropriate to show up early for class without your homework, planning to get the homework done before class with your classmates' help. In general, you are abusing the intent of our homework policy if you find yourself putting minimal time into homework by leaning on classmates who have already done the work. In short, be true to yourself so that you can be true to others.

EXTRA INSTRUCTIONS (EI)

You are expected to read all applicable material and attempt all assigned homework prior to seeking EI. Schedule an appointment if possible and come prepared with questions. There will be no spoon-feeding.

MATERIALS NEEDED FOR CLASS

For every class you will need to bring the applicable textbooks, a pencil or pen, paper, and your brain.

CONCLUSION

We think that the subjects covered in Physics 315 are both fascinating and challenging. They have direct applications to your future Air Force career. The instructor's intent is to make this class an exploration of some of the laws, principles, and tactics that can help us win the air war. Stay ahead, work hard, and you may begin to appreciate and understand the incredible number of factors that separate the winners from the losers on the field of battle.

EDWARD B. TOMME, LtCol, USAF
Course Director, Physics 315

FRANCIS CHUN, Lt Col, USAF
Director of Advanced Programs